WPX Energy – Various Well Sites
Partial Compliance Evaluation (PCE)
On-Site Clean Air Act (CAA) Inspections

Inspection Date:	June 19-20, 2018
Inspection Report Date:	December 7, 2018
EPA Representatives:	Bob Gallagher – EPA Region 8 Bill Squier – EPA NEIC Doreen Au – EPA NEIC
Tribal Representatives:	Bird Lockwood – MHA Energy
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Inspection Report Prepared By:	Bob Gallagher
Inspection Report Reviewed By:	Scott Patefield
Applicable Rules:	Fort Berthold Indian Reservation (Mandan, Hidatsa and Arikara Nation), North Dakota (Fort Berthold FIP)

Observations

The EPA and MHA Energy inspected numerous WPX Energy (WPX) well sites/pads and attempted to detect natural gas emissions using infrared (IR) cameras and the Geospatial Measurement of Air Pollutants (GMAP) mobile unit. The inspections were conducted at locations with new wells, at facilities with previously noted emissions, and in specific areas on the Fort Berthold Indian Reservation. See Appendix A for more location details.

Appendix A also includes a table with inspection details for each site visited and the wells associated with each pad.

Bird Lockwood of MHA Energy accompanied EPA staff onsite at the locations for inspections on June 19-20, 2018. EPA staff used a FLIR IR camera as well as the GMAP mobile monitoring to determine emissions and measure concentrations of methane (CH_4), benzene, and toluene. MHA Energy staff used an Opgal IR camera to detect emissions at the well pad sites.

Inspection Information

EPA inspectors scanned well sites located on the Fort Berthold Indian Reservation (FBIR) for detectable emissions using an IR camera and using the GMAP. Specifically, EPA and MHA Energy inspectors scanned for detectable emissions from crude and/or water storage tanks, generators, flares, and piping at

the well pads. EPA focused on newly constructed wells where emissions are more likely to be observed. Additionally, at the FBIR sites, EPA observed flares with the IR camera to determine if the flares appeared to be in compliance with Fort Berthold FIP applicable requirements. Please be advised that this inspection report is finalized, but that the report is not a final determination of compliance.

Fort Berthold FIP Applicability

Based on drilling information reported to the NDIC well index by WPX, the well sites listed in Appendix A were completed after the August 12, 2007 applicability date (per 40 C.F.R. § 49.4161) and are producing from the Bakken Pool (per 40 C.F.R. § 49.4163(a)(1)) and are thus subject to the Fort Berthold FIP (See Table 1).

Closed Vent System Equipment Requirements [§49.4165(b)(1)]

"Each closed-vent system must route all produced natural gas and natural gas emissions from production and storage operations to the natural gas sales pipeline or the control devices…". The EPA, using an IR camera, inspected each facility to ensure all emissions are being routed from the storage tanks to the emissions control device. As an area of concern, the IR camera detected emissions from tanks on the Arikara 12-22HW, Arikara 12-22HX, and the Charles Blackhawk 31-30HD pads.

Closed Vent System Equipment Requirements [§49.4165(b)(3)]

"Each closed-vent system must be designed to operate with no detectable natural gas emissions." The EPA, using an IR camera, inspected each closed-vent system to ensure that there were no detectable emissions. As an area of concern, the GMAP mobile monitors detected emissions of methane, benzene, and toluene on the Arikara 15-22HB pad. Emissions of methane were also detected on the Blackhawk 1-12H pad.

Utility Flares [§49.4165(c)(6)(i)]

"The owner or operator must ensure that each enclosed combustor and utility flare is: (i) Operated properly at all times that produced natural gas and/or natural gas emissions are routed to it." EPA looked at each utility flare for any indication that the utility flare was not being operated properly.

Utility Flares [§49.4165(6)(vii)]

"The owner or operator must ensure that each enclosed combustor and utility flare is: (vii) Operated with no visible smoke emissions." EPA looked at each utility flare for any indication of visible smoke emissions.

Areas of Concern

The following areas of concern were noted:

- The IR camera detected emissions from tanks on the Arikara 12-22HW, Arikara 12-22HX, and the Charles Blackhawk 31-30HD pads.
- The GMAP mobile monitors detected emissions of methane, benzene, and toluene on the Arikara 15-22HB pad. Emissions of methane were also detected on the Blackhawk 1-12H pad.

Table 1 - Requirements Applicable to Inspection Observations		
Regulation	**Requirement Type**	**Regulatory Text**
Fort Berthold FIP	Control Equipment Requirements – Covers	§49.4165(a): (a) Covers. Each owner or operator must equip all openings on each produced oil storage tank and produced water storage tank interconnected with produced oil storage tanks with a cover to ensure that all natural gas emissions are efficiently being routed through a closed-vent system to a vapor recovery system, an enclosed combustor, a utility flare, or a pit flare. (1) Each cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves (PRV), and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the produced oil and produced water in the storage tank. (2) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows: (i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit); (ii) To inspect or sample the material in the unit; or (iii) To inspect, maintain, repair, or replace equipment located inside the unit. (3) Each thief hatch cover shall be weighted and properly seated. (4) Each PRV shall be set to release at a pressure that will ensure that natural gas emissions are routed through the closed-vent system to the vapor recovery system, the enclosed combustor, or the utility flare under normal operating conditions.
Fort Berthold FIP	Control Equipment Requirements – Closed-vent systems	(b) Closed-vent systems. Each owner or operator must meet the following requirements for closed-vent systems: (1) Each closed-vent system must route all produced natural gas and natural gas emissions from production and storage operations to the natural gas sales pipeline or the control devices required by paragraph (a) of this section. (2) All vent lines, connections, fittings, valves, relief valves, or any other appurtenance employed to contain and collect natural gas, vapor, and fumes and transport them to a natural gas sales pipeline and any VOC control equipment must be maintained and operated properly at all times. (3) Each closed-vent system must be designed to operate with no detectable natural gas emissions. (4) If any closed-vent system contains one or more bypass devices, except as provided for in paragraph (b)(4)(iii) of this section, that could be used to divert all or a portion of the natural gas emissions, from entering a natural gas sales pipeline and/or any control devices, the owner or operator must meet the one of following requirements for each bypass device: (i) At the inlet to the bypass device that could divert the natural gas emissions away from a natural gas sales pipeline or a control device and into the atmosphere, properly install, calibrate, maintain, and operate a natural gas flow indicator that is capable of taking continuous readings and sounding an alarm when the bypass device is open such that natural gas emissions are being, or could be, diverted away from a natural gas sales pipeline or a control device and into the atmosphere;

Table 1 - Requirements Applicable to Inspection Observations		
Regulation	**Requirement Type**	**Regulatory Text**
		(ii) Secure the bypass device valve installed at the inlet to the bypass device in the non-diverting position using a car-seal or a lock-and-key type configuration; (iii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements applicable to bypass devices.
Fort Berthold FIP	Control Equipment Requirements – Enclosed combustors and utility flares	(c) Enclosed combustors and utility flares. Each owner or operator must meet the following requirements for enclosed combustors and utility flares: (1) For each enclosed combustor or utility flare, the owner or operator must follow the manufacturer's written operating instructions, procedures and maintenance schedule to ensure good air pollution control practices for minimizing emissions; (2) For each enclosed combustor or utility flare, the owner or operator must ensure there is sufficient capacity to reduce the mass content of VOC in the produced natural gas and natural gas emissions routed to it by at least 98.0 percent for the minimum and maximum natural gas volumetric flow rate and BTU content routed to the device; (3) Each enclosed combustor or utility flare must be operated to reduce the mass content of VOC in the produced natural gas and natural gas emissions routed to it by at least 98.0 percent; (4) The owner or operator must ensure that each utility flare is designed and operated in accordance with the requirements of 40 CFR 60.18(b) for such flares, except for §60.18(c)(2) and (f)(2) for those utility flares operated with an electronically controlled automatic igniter. (5) The owner or operator must ensure that each enclosed combustor is: (i) A model demonstrated by a manufacturer to the meet the VOC destruction efficiency requirements of §§49.4161 through 49.4168 using the procedure specified in 40 CFR part 60, subpart OOOO at §60.5413(d) by the due date of the first annual report as specified in §49.4168(b); or (ii) Demonstrated to meet the VOC destruction efficiency requirements of §§49.4161 through 49.4168 using EPA approved performance test methods specified in 40 CFR part 60, subpart OOOO at §60.5413(b) by the due date of the first annual report as specified in §49.4168(b). (6) The owner or operator must ensure that each enclosed combustor and utility flare is: (i) Operated properly at all times that produced natural gas and/or natural gas emissions are routed to it; (ii) Operated with a liquid knock-out system to collect any condensable vapors (to prevent liquids from going through the control device); (iii) Equipped with a flash-back flame arrestor; (iv) Equipped with one of the following: (A) A continuous burning pilot flame. (B) An electronically controlled automatic igniter; (v) Equipped with a monitoring system for continuous recording of the parameters that indicate proper operation of each enclosed combustor, utility flare, continuous burning pilot flame, and electronically controlled automatic igniter, such as a chart recorder, data logger or similar devices;

Table 1 - Requirements Applicable to Inspection Observations		
Regulation	**Requirement Type**	**Regulatory Text**
		(vi) Maintained in a leak-free condition; and (vii) Operated with no visible smoke emissions.
Fort Berthold FIP	Control Equipment Requirements – Pit flares	(d) Pit Flares. Each owner or operator must meet the following requirements for pit flares: (1) The owner or operator must develop written operating instructions, operating procedures and maintenance schedules to ensure good air pollution control practices for minimizing emissions from the pit flare based on the site-specific design. (2) The owner or operator must only use a pit flare for the following operations: (i) To control produced natural gas and natural gas emissions during well completion operations or recompletion operations; (ii) To control produced natural gas and natural gas emissions in the event that natural gas recovered for pipeline injection must be diverted to a backup control device because injection is temporarily infeasible and there is no operational enclosed combustor or utility flare at the oil and natural gas production facility. Use of the pit flare for this situation is limited to a maximum of 500 hours in any twelve (12) consecutive months; or (iii) Control of standing, working, breathing, and flashing losses from the produced oil storage tanks and any produced water storage tank interconnected with the produced oil storage tanks if the uncontrolled potential VOC emissions from the aggregate of all produced oil storage tanks and produced water storage tanks interconnected with produced oil storage tanks is less than, and reasonably expected to remain below, 20 tons in any consecutive 12-month period. (3) The owner or operator must only use the pit flare under the following conditions and limitations: (i) The pit flare is operated to reduce the mass content of VOC in the produced natural gas and natural gas emissions routed to it by at least 90.0 percent; (ii) The pit flare is operated in accordance with the site-specific written operating instructions, operating procedures, and maintenance schedules to ensure good air pollution control practices for minimizing emissions; (iii) The pit flare is operated with no visible smoke emissions; (iv) The pit flare is equipped with an electronically controlled automatic igniter; (v) The pit flare is visually inspected for the presence of a flame anytime produced natural gas or natural gas emissions are being routed to it. Should the flame fail, the flame must be relit as soon as safely possible and the electronically controlled automatic igniter must be repaired or replaced before the pit flare is utilized again; and (vi) The owner or operator does not deposit or cause to be deposited into a flare pit any oil field fluids or oil and natural gas wastes other than those designed to go to the pit flare.
Fort Berthold FIP	Control Equipment Requirements –	(e) Other Control Devices. Upon prior written approval by the EPA, the owner or operator may use control devices other than those listed above that are determined by EPA to be capable of reducing the mass content of VOC in the natural gas routed to it by at least 98.0 percent, provided that:

Table 1 - Requirements Applicable to Inspection Observations		
Regulation	**Requirement Type**	**Regulatory Text**
	Other Control Devices	(1) In operating such control devices, the owner or operator must follow the manufacturer's written operating instructions, procedures and maintenance schedule to ensure good air pollution control practices for minimizing emissions; and (2) The owner or operator must ensure there is sufficient capacity to reduce the mass content of VOC in the produced natural gas and natural gas emissions routed to such other control devices by at least 98.0 percent for the minimum and maximum natural gas volumetric flow rate and BTU content routed to each device. (3) The owner or operator must operate such a control device to reduce the mass content of VOC in the produced natural gas and natural gas emissions routed to it by at least 98.0 percent.

APPENDIX A: Inspection Details

Date	Wellpad Permit No	Current Well Name	PCE/FCE	IR Camera Footage Taken File #	GMAP File	Emissions Measured by GMAP
6/19/2018	23964	ARIKARA 15-22HB	PCE (Did not assess engines)	MOV_0109	180619-MA01	CH4 = 418.3 ppm Benz = 1067 ppb Tolu = 1316 ppb
	23967	ARIKARA 15-22HD		MOV_0110	180619-MA02	
	23965	ARIKARA 15-22HW		MOV_0111		
	23963	ARIKARA 15-22HX		MOV_0112		
	23966	ARIKARA 15-22HY				
	33619	ARIKARA 15-22HA				
	19768	ARIKARA 15-22HC				
	33642	ARIKARA 15-22HQL				
	33381	MANDAN NORTH 13-24HW		MOV_0114	180619-MA03	
	33382	MANDAN NORTH 13-24HA			180619-MA04	
	33383	MANDAN NORTH 13-24HB				
	33384	MANDAN NORTH 13-24HX				
	33385	MANDAN NORTH 13-24HC				
6/20/2018	21219	(Tri Unit Pad) BLACKHAWK 1-12H	PCE (Did not assess engines)	MOV_0146	180620-MA07	CH4 = 82.5 ppm
	23305	BLACKHAWK 1-12HB		MOV_0147	180620-MA08	
	23303	BLACKHAWK 1-12HA		MOV_0148	180620-MA09	
	23304	BLACKHAWK 1-12HW		MOV_0149		
	23306	BLACKHAWK 1-12HY		MOV_0150		
	23307	BLACKHAWK 1-12HZ		MOV_0151		
	23308	BLACKHAWK 1-12HD		MOV_0152		
	21218	GOOD BIRD 36-25HC		MOV_0153		
	23312	GOOD BIRD 36-25HB		MOV_0154		
	23314	GOOD BIRD 36-25HA		MOV_0155		
	23313	GOOD BIRD 36-25HW		MOV_0156		
	23311	GOOD BIRD 36-25HX		MOV_0157		
	23310	GOOD BIRD 36-25HZ		MOV_0158		
	23309	GOOD BIRD 36-25HD		MOV_0159		
	22655	CHARLES BLACKHAWK 31-30HD		MOV_0160		
	22654	CHARLES BLACKHAWK 31-30HZ				
	22653	CHARLES BLACKHAWK 31-30HC				
	22652	CHARLES BLACKHAWK 31-30HY				
	22651	CHARLES BLACKHAWK 31-30HB				
	22650	CHARLES BLACKHAWK 31-30HX				
	22649	CHARLES BLACKHAWK 31-30HA				

APPENDIX B: IR Log

COMPANY/ OPERATOR	SITE	FILE DATE	File #.Format	PHOTO GRAPHER	DISTANCE (yds) Camera to Leak	DESCRIPTION
WPX	ARIKARA 15-22HB	6/19/2018	MOV_0109.mp4	D. Au	Not reported	Produced water tanks
WPX	ARIKARA 15-22HD	6/19/2018	MOV_0110.mp4	D. Au	Not reported	Produced water tanks after operator attempted fix on seal
WPX	ARIKARA 15-22HW	6/19/2018	MOV_0111.mp4	D. Au	Not reported	Tanks began leaking again
WPX	ARIKARA 15-22HX	6/19/2018	MOV_0112.mp4	D. Au	Not reported	Tanks began leaking again
WPX	ARIKARA 15-22HY	6/19/2018	MOV_0113.mp4	D. Au	Not reported	camera accidentally recording, video deleted
WPX	BLACKHAWK 1-12HB	6/20/2018	MOV_0146.mp4	D. Au	Not reported	in Charles Blackhawk row overview from southwest corner
WPX	BLACKHAWK 1-12HA	6/20/2018	MOV_0147.mp4	D. Au	Not reported	in Charles Blackhawk row south side middle section
WPX	BLACKHAWK 1-12HW	6/20/2018	MOV_0148.mp4	D. Au	Not reported	in Charles Blackhawk row 3101HA1, 3130HA
WPX	BLACKHAWK 1-12HY	6/20/2018	MOV_0149.mp4	D. Au	Not reported	accidentally not saved
WPX	BLACKHAWK 1-12HZ	6/20/2018	MOV_0150.mp4	D. Au	Not reported	in front of Goodbird 36-25 HC2 tank
WPX	BLACKHAWK 1-12HD	6/20/2018	MOV_0151.mp4	D. Au	Not reported	in front of Goodbird 36-25 HCL 1 and Goodbird 36-25 HC produced water
WPX	GOOD BIRD 36-25HC	6/20/2018	MOV_0152.mp4	D. Au	Not reported	overview from Goodbird 36-25-HA-3 heading east
WPX	GOOD BIRD 36-25HB	6/20/2018	MOV_0153.mp4	D. Au	Not reported	set of 3 water treaters south side of Goodbird row
WPX	GOOD BIRD 36-25HA	6/20/2018	MOV_0154.mp4	D. Au	Not reported	hammerjoint on flare line on northwest side treater Goodbird line
WPX	GOOD BIRD 36-25HW	6/20/2018	MOV_0155.mp4	D. Au	Not reported	Blackhawk row NW treater insulation area
WPX	GOOD BIRD 36-25HX	6/20/2018	MOV_0156.mp4	D. Au	Not reported	Blackhawk row NW treater lower insulation area
WPX	GOOD BIRD 36-25HZ	6/20/2018	MOV_0157.mp4	D. Au	Not reported	Blackhawk row NW treater plug from backside view
WPX	GOOD BIRD 36-25HD	6/20/2018	MOV_0158.mp4	D. Au	Not reported	in front of Blackhawk tank 1-12HD2
WPX	CHARLES BLACKHAWK 31-30HD	6/20/2018	MOV_0159.mp4	D. Au	Not reported	Overview venting from produced water tanks Blackhawk 1-12 H2 heading from east to west
WPX	BLACKHAWK 1-12HB	6/20/2018	MOV_0160.mp4	D. Au	Not reported	from Blackhawk 1-12 HB2 from west to east